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Gorard, Stephen

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Stephen Gorard
School of Education
University of Birmingham
s.gorard@bham.ac.uk

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Abstract

Are the early expressed attitudes of pupils to staying on in education post-16 a valuable predictor? This is an important question, because if such attitudes are very likely to be converted into subsequent revealed actions then the early attitudes provide a sound basis for planning and intervention. This short paper queries the scientific accuracy of claims made in a previous paper by Croll (2010) based on a re-analysis of the British Household Panel Survey. It shows that even if the expressed intentions of young people to stay on in education post-16 were actually unrelated to their subsequent participation, the figures used by Croll would still display a substantial overlap between the two. This is because both reported intentions to stay on and subsequent participation are heavily imbalanced in favour of staying on. If this imbalance is taken into account then Croll's conclusions, that early intentions are accurate and useful, fall to the ground. On these data, we should take little or no account of early expressed intentions to study post-16.

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Introduction

Are the early expressed attitudes of pupils to staying on in education post-16 a valuable predictor? This is an important question, because if such attitudes are very likely to be converted into subsequent revealed actions then the early attitudes provide a sound basis for planning and intervention. This short paper queries the scientific accuracy of claims made in a previous paper by Croll (2010). In an analysis of the Youth Survey data from the British Household Panel survey, Croll (2010) states 'The results show that most children can express intentions with regard to future participation very early in their secondary school careers and that these intentions are good predictors of actual behaviour five years later' (p.400). If this strong claim is true, we should then agree with Croll that a focus on improving intentions to participate when pupils are years away from making that decision could pay dividends in terms of later participation. This might be particularly effective for those pupils

most likely to express an intention to leave education. On the other hand, if this claim is not true, we may be misled into wasting time and resource on what children say at an early age rather than on minimising the very real influence of social and economic background, and maximising the chances that pupils enjoy education, and get the best qualifications possible. The practical differences between a focus on changing what people *say* they will do years later, and attending to what we know about actual patterns of participation from the past to help reduce inequalities in the future, are substantial. So it is important to be clear whether the kind of claims made by Croll (2010) are warranted by the evidence presented in his paper.

My major worry on reading the paper was that Croll did not display appropriate scepticism about the results, especially about being misled by the imbalance of the reported early intentions and of pupils' subsequent revealed choices post-16. The key claimed findings in Croll (2010) are that pupils aged 11 upwards (in year 7 and thereafter) can express an intention to participate in education post-16, and that these intentions are valid in the sense of being accurate predications of later behaviour, and reliable in the sense of being substantially invariant over time. For example, the paper concludes 'The longitudinal analysis has shown that most children were able to express intentions about future educational participation just after they had started secondary school and these intentions were a good predictor of their behaviour five years later' (Croll 2010, p.414). Are either of these claims, about accuracy and stability, true?

Accuracy of intentions?

Of the figures in his Table 1, Croll (2010) says 'What is very striking [is] that what children said at the age of 11 or just over… was a good predictor of what they actually did five years later' (p.406). The relevant figures are repeated in Table 1 here, with 725 year 7 pupils from a total of 1,081 reporting an intention to stay in education after year 11. Croll also states that these intentions turned out to be 75.9% 'accurate' in the sense that nearly 76% of pupils did indeed participate post-16 or not, as they reported in year 7. In assessing how accurate the year 7 pupil intentions turned out to be, Croll understandably ignored those who did not express a clear intention at that

stage, and concluded ‘Just over three-quarters of the children expressing an intention in year 7 carried out that intention post-16’ (p.406). This sounds impressive evidence for the accuracy of early intentions, and indeed this apparently high level of accuracy forms the basis for his whole paper.

Table 1 – Reported intentions for post-16 participation, year 7 pupils

Stay on	Leave	Don’t know	Total
725	118	238	1081

Source: Croll (2010, p.406)

Croll does not say exactly how many of the 1,081 pupils in Table 1 did indeed stay on, and this is an important piece of data missing from the paper, and from his consideration of the meaning of the 75.9% ‘accuracy’ figure. However, the overall staying on rate for the various panels he considers (totalling 1,715 individual pupils) is 71.6% (p.406), so let us assume that this is something like the true figure for the 1,081 pupils questioned in year 7. In fact, 72% could be an underestimate of the population figure for Britain, which has been over 70% participation in full-time education post-16 for many years now, topped up by others participating in part-time education, plus employer and government-funded training schemes (Gorard et al. 2007). By ignoring those replying ‘don’t know’ in Table 1, like Croll, we end up with 843 pupils in year 7 (1081-238), of whom 86% (725/843) reported an intention to stay on in education. So now we have the three numeric parameters we need to make a judgement about the claim to accuracy. In this study, 86% of year 7 pupils intended to stay on, around 72% did so and, added to those intending not to stay on and not staying on in fact, these intentions are 76% accurate. The first thing to notice, of course, is the imbalance in the two prior figures. A clear majority of pupils intend to stay on and a clear majority do so. Table 2 summarises this imbalance. It also divides pupils into a notional 72% ‘observed’ to stay on and 28% observed to leave for both those pupils intending to stay on and those intending to leave. In other words, Table 2 provides the baseline of frequencies that would be expected if intention in Year 7 and participation after Year 12 were completely unrelated.

Table 2 – Assessing the accuracy of intentions if participation is unrelated

	Intention to stay on	Intention to leave	Total
'Observed' to stay on	519	84	603
'Observed' to leave	206	34	240
Total	725	118	843

Just because most pupils say they will stay on and most pupils do stay on, using intention to 'predict' participation will be 66% ([519+34]/843) accurate even though in my analysis the two things are designed to be completely unrelated. This means that Croll's figure for the accuracy of intentions (see above) is only 10% better than pure chance. Presumably it is possible to imagine around 10% of each cohort already knowingly on a trajectory towards school avoidance or long-term academic success. This would mean that Croll is wrong to say that expressed intentions are good predictors of later participation more generally. Intentions are rather weak predictors, if indeed they are predictors at all (see below).

Looked at another way, by how much can using pupil year 7 intentions help to make a more accurate prediction of whether they stayed on post-16 than we could make without using them? Since 72% of pupils stay on in fact, if we predicted that all year 7 pupils would stay on then we would be right in around 72% of cases. This is even better than the 66% chance model above, and makes Croll's accuracy of 76% look less impressive again. Using intentions would only improve the base prediction by 34 pupils (4% of 843). If this were a logistic regression model, with a binary outcome variable of participation or not, it would fail because both the outcome and the predictor are so skewed. It is a shame that Croll did not attempt such a model, or similar, and that the journal reviewers for BJES did not request it, since it would quickly reveal the flaw in the claims about intentions being 76% accurate. Intentions improve the accuracy of predictions by 4% at best.

Croll describes a standard set of potential background determinants associated with post-16 participation like prior attainment, sex, and family background. These could have been used in a model to predict participation, and would probably improve predictions by more than the 4% increase on the baseline due to using intentions (see

Gorard and Rees 2002, or Selwyn et al. 2006, for example). And using them would almost certainly have led to intentions being dropped from the model, once background and prior attainment were accounted for – because the expressed intentions are partly a product of these same determinants, and because the 4% would then be dwarfed by the scale of 'effect' sizes revealed in Croll's Table 4 (p.410).

Stability of intentions?

Turning to a second aspect of the claim about the value of early expressed intentions, how volatile were they? Croll shows (in his Table 3, p.407) that, at some stage between year 7 and year 11, 92.5% of pupils expressed an intention to stay on. With around 72% of pupils staying on, this means that around 67% of stayers (.72 times .93) will have expressed an 'intention' to do so even if such intentions were completely meaningless. Only 40.8% of pupils expressed the same intention when asked repeatedly from year 7 to year 11. I reproduce here as my Table 3 the relevant section of Table 3 from Croll (2010, p.407). It is clear that the majority of pupils changed their mind over the six years from Year 7 onwards. Expressed intentions are described by Croll as accurate predictors of behaviour, but if a pupil selects both of two outcomes on different occasions then they must be right at least once! Whatever it is that reported intentions are expressing it is very volatile, and this surely suggests a lack of substantive correlation between declared intention and behaviour.

Table 3 – Percentage of pupils consistent in their declared intentions – Year 7 to Year 11

Stay on	Leave	Don't know
40.8	1.5	2.7

Only 666 of the young people were interviewed on at least four of the five occasions that they could have been between Years 7 and 11 (p.407). Unfortunately, Croll does not tell us how many had four and how many had five interviews. The methods section (p.405) suggests that most of these 666 had only four interviews, but it would have taken little space to clarify for the reader. So using four interviews as the basis

for a calculation how impressive is this core of 41% of pupils with consistent responses over time about staying on? In year 7, Croll reports that over 86% of pupils who express an intention say they will stay on, and 88% say this in each of the next three years. If these reports were actually meaningless in relation to their future intentions, then after four interviews we would expect to find that 59% of pupils (0.86 times 0.88 times 0.88 times 0.88) had 'consistently' reported an intention to stay on. Again, this result is a product of the initial imbalance in the responses, and tells us nothing about the link between intention and revealed behaviour. If we accept that some pupils may have had five interviews, that intention to stay on drops to 84% in year 11, and that the proportion of 'don't knows' reduces over time, then my result may drop to less than 59% consistent responses (even though just by chance). But Croll only found 41% of pupils consistently reporting an intention to stay on. This can hardly be *more* than chance, and certainly would not lead one to the strong conclusion that intentions were stable and useful predictors of behaviour.

Summary

In a skewed situation as we face when looking at both reported intentions and revealed patterns of staying on, it behoves us to consider what the 'accuracy' of intentions would be if they really meant nothing at all. This is just an example of the standard warranting principle – if the conclusion were false how else could we explain the evidence found? (see Gorard 2002). The fact that Croll does not use the warrant principle, as a matter of course, to address any of this is worrying, as is the fact that none of the referees picked it up before publication. In the same issue of BJES, Coe (2010) makes an understandable plea for the kind of scepticism underlying the warranting principle when we consider causal claims based on passive designs. He cautions against what I have called the *post hoc* dredging of sullen datasets (Gorard 2006, p.76). But the same thing also applies to the more descriptive associations presented by Croll here. This is not something that the complex techniques derived from sampling theory can address at all – it is about care and sceptical judgement in the use of numeric (and indeed any) data. Otherwise, the consequences, if taken seriously, could mean research, policy and practice attention being diverted from the understanding of choice behaviour into a blind alley.

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